

PATENT  
Docket No.: 48317USA3C.014

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:

DANIEL A. JAPUNTICH ET AL.

Serial No.: 08/240,877

Filed: May 11, 1994

For: UNIDIRECTIONAL FLUID VALVE

Group Art Unit: 3761

Examiner: A. Lewis

**AFFIDAVIT OF DAVID M. CASTIGLIONE**

I, David M. Castiglione, swear as follows:

1. That I am presently a product development engineer at 3M Company in St. Paul, Minnesota.
2. That I received a Bachelor of Science degree in Materials Engineering from the Rensselaer Polytechnic Institute, which I received this degree in May of 1990. I also have a Masters of Science degree in Materials from the University of California at Santa Barbara. I received this degree in 1992.
3. That I began work at the 3M Company in St. Paul, Minnesota after receiving my Masters of Science degree from the University of California. I began work with 3M in the Automotive Engineered Systems Division and worked in that division through September of 1993.
4. That I began work for the Occupational Health & Environmental Safety Division (OH&ES) in October of 1993 and continue to work in that division at the present time. My work with the OH&ES division has entailed the design and development of respirators and respirator components. I have also worked with the study and maintenance of exhalation valves for negative pressure respirators. These duties have included evaluating the performance of exhalation valves as well as their function. I have calculated the percent flow through the valve,

as well as analyzing the dynamic performance of the valve during simulated exhalation flows. I have also analyzed competitive designs of exhalation valves for negative pressure respirators.

5. That I have filed six United States patent applications for the OH&ES Division since I began employment with this business unit. The six patent applications include three utility patent applications and three design patent applications.

6. That I have reviewed U.S. Patent Application Serial No. 08/240,877 and the claims that are presently pending in this application. That I understand that the application claims a filtering face mask that comprises a mask body and an exhalation valve. I further understand that the exhalation valve includes a valve seat and a single flexible flap. The single flexible flap has a fixed portion and one free portion. The one free portion of the flexible flap is pressed towards the seal surface of the valve seat in an abutting relationship with it when the wearer is neither inhaling nor exhaling.

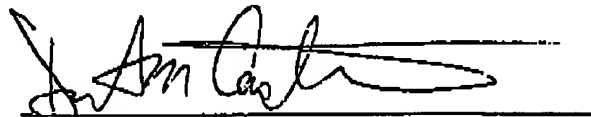
7. That I have reviewed UK Patent Application GB 2072516A. This patent discloses a respiratory face mask in the form of a pouch (1, 2) that is shaped to cover the nose and mouth of a wearer. The pouch is formed from a filtration effective sheet material and is provided with unidirectional exhalation valves (12, 13, 14). In Figure 2, a flap valve 13 is shown that comprises a flexible circular flap member 15 that is arranged to cover and close valve openings 16 during an inhalation. Flap member 15 flexes away from these openings 16 during an exhalation.

8. That I have reviewed the Office Action mailed November 8, 2000, and understand that the Examiner has taken the position that the free portion of the flexible flap disclosed in Figure 2 is "pressed toward the seal surface in an abutting relationship therewith when the wearer is neither inhaling or exhaling."

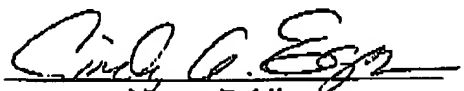
9. That I do not agree with the position taken by the Examiner at the bottom of page 3 of the Office Action. My review of the '516 UK patent application leads me to the conclusion that the valve 13 shown in Figure 2 does not have its flap 15 pressed towards the seal surface in an abutting relationship when the wearer is neither inhaling or exhaling. The '516 application reveals two distinctly different valves: a flap valve 13 as shown in Figure 2; and a diaphragm valve 14 as shown in Figure 3. These flaps have distinctly different constructions and operate differently. The valve shown in Figure 2 has a flat seal surface. The mounting of the flap 15 to

the seal surface at the top or fixed portion of the flap does not show a preload on the flap 15. There is nothing that can be discerned from Figure 2 or from the specification that would indicate that the flap is pressed towards the seal surface in its neutral position. And because Figure 3 shows a flap 18 resting upon the seal surface in the flap's neutral position while Figure 2 shows the flap 15 dangling away from the seal surface in an apparent neutral position also, it can be concluded that the valve 13 of Figure 2 would only become pressed against the seal surface during an inhalation. A review of the '516 UK application thus leads me to believe that the valve shown in Figure 2 is a unidirectional exhalation valve that prevents the influx of contaminants through the exhalation valve during an inhalation when it is most needed. It is not apparent to me that the valve would be pressed towards the seal surface under a neutral condition when the wearer is neither inhaling nor exhaling.

10. That I further understand that the Examiner has interpreted the '516 UK application to disclose a flexible flap that is pressed towards the seal surface because of the disclosure presented in Figure 3. This Figure, however, discloses a "button-type valve" where a flexible circular valve member 18 is centrally mounted by hub 21. This valve is different in structure and function from the valve shown in Figure 2, and therefore any teaching which shows that the flexible flap 18 engages a circular knife-edge valve seat 19 is not applicable to the flap valve presented in Figure 2.

  
David M. Castiglione

Subscribed and sworn to before me  
this 2 day of February, 2001.

  
Notary Public

